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TOXOPLASMOSIS IN PREGNANT WOMEN: PREVALENCE, RISK FACTORS AND PREVENTION ACTIONS

TOXOPLASMOSE EM GESTANTES: PREVALÊNCIA, FATORES DE RISCO E AÇÕES DE PREVENÇÃO

TOXOPLASMOSIS EN GESTANTES: PREVALENCIA, FACTORES DE RIESGO Y ACCIONES DE PREVENCIÓN

Mariana Silveira Tavares[1], Raquel Melo Araujo[2], Ana Cristina Freire Abud[3], José Antonio Barreto Alves[4], Mariangela da Silva Nunes[5], Ana Dorcas de Melo Inagaki[6]

ABSTRACT

Objectives: to characterize the profile of pregnant women from Aracaju, Brazil cared for by the Health Care System. ***Method:*** epidemiological, transversal, descriptive study, with a convenient non-probabilistic sample of 395 pregnant women. The sample calculation was based on the number of live births in 2009. Data collection occurred from March to July 2011 after approval by the Research Ethics Committee at the Federal University of Sergipe, Brazil by protocol No. 1192.0.000.107-08. The data were processed using the Epi Info 6.0 software. To investigate the association between the presence of toxoplasma antibodies and the risk factors were applied to the Chi-square test and Fisher Exact test with Univariate Analysis, at a significance level of 5%. ***Results:*** the average age was 25.6 years; with low income and schooling; 66.5% initiated prenatal care in the first trimester; 37.9% attended less than six consultations and only 52.4% performed serology for toxoplasmosis. The prevalence of IgG anti-toxoplasma was 43.5%. The risk factors related to toxoplasmosis was feline contact and soil handling. Only 10.2% of pregnant women identified as susceptible to the *Toxoplasma-gondii* infection repeated the serology throughout pregnancy. One pregnant woman with possible sero-conversion was not properly evaluated. ***Conclusion:*** the prevalence of anti-toxoplasma antibodies reveals a high risk of congenital infection. However, prenatal care has been ineffective in preventing toxoplasmosis. It is considered that the hygienic-dietary guidelines associated with maternal and/or neonatal serum screening represent an important tool for diagnosing and preventing congenital toxoplasmosis. ***Descriptors*:** toxoplasmosis; pregnant women; prevalence; risk factors; congenital toxoplasmosis.

RESUMO

Objetivo: caracterizar o perfil das gestantes aracajuanas assistidas no Sistema Único de Saúde. ***Método***: estudo epidemiológico, transversal, descritivo, com amostra não probabilística de conveniência de 395 gestantes. O cálculo amostral foi a partir do número de nascidos vivos em 2009. A coleta de dados, com formulário estruturado e análise do cartão da gestante, ocorreu de março a julho de 2011, após aprovação do projeto de pesquisa pelo Comitê de Ética em Pesquisa da Universidade Federal de Sergipe sob o n. 1192.0.000.107-08. Os dados foram processados no Programa Epi info 6.0. Para verificar a associação entre a presença de anticorpos antitoxoplasma e os fatores de risco, foram aplicados os Testes Qui-quadrado e Exato de Fisher de Análise Univariada, com nível de significância de 5%. ***Resultados*:** a idade média foi de 25,6 anos; com baixa renda e escolaridade; 66,5% iniciou o pré-natal no primeiro trimestre; 37,9% frequentou menos que seis consultas e 52,4% realizou sorologia para toxoplasmose. A prevalência de IgG antitoxoplasma foi de 43,5%. Os fatores de risco associados foram contato com gato e manejo do solo. Apenas 10,2% das gestantes identificadas como suscetíveis à infecção pelo *Toxoplasma gondii* repetiu a sorologia no decorrer da gestação. Uma gestante com possível soro-conversão não foi adequadamente avaliada. ***Conclusão*:** A prevalência de anticorpos antitoxoplasma revela alto risco de infecção congênita, entretanto, o pré-natal tem sido ineficaz para prevenção da toxoplasmose. Considera-se que as orientações higiênico-dietéticas associadas à triagem sorológica materna e/ou neonatal, representam ferramenta importante no diagnóstico e prevenção da toxoplasmose congênita. ***Descritores***: toxoplasmose; gestantes; prevalência; fatores de risco; toxoplasmose congênita.

RESUMEN

Objetivos: caracterizar perfil de gestantes de Aracaju, Brasil asistidas por el Sistema Único de Salud. ***Método***: estudio epidemiológico, transversal, descriptivo, con la muestra no probabilística de conveniencia de 395 mujeres embarazadas. El cálculo de la muestra basada en el número de nacidos vivos en 2009. La colecta de datos ocurrió entre marzo y julio de 2011 tras aprobación del Comité de Ética en Investigación de la Universidad Federal de Sergipe, Brazil bajo protocolo nº 1192.0.000.107-08. Los datos fueron procesados utilizando el programa Epi Info 6.0. Para investigar la asociación entre la presencia de anticuerpos de toxoplasma y los factores de riesgo se han aplicado las Pruebas Chi-cuadrado y exacta de Fisher de Análisis univariado, con un nivel de significación del 5%. ***Resultados***: la edad media fue 25,6 años; baja renta y escolaridad; 66,5% inició pre-natal en el primer trimestre; 37,9% frecuentó menos que seis consultas y sólo 52,4% realizó serología para toxoplasmosis. La prevalencia de IgG anti-toxoplasma fue 43,5%. Los factores de riesgo asociados fueron contacto con gato y manejo del suelo. Sólo 10,2% de las mujeres embarazadas susceptibles a la infección del Toxoplasma gondii repitió serología durante la gestación. Una mujer embarazada con la seroconversión es posible que no se evaluó adecuadamente. ***Conclusión***: la prevalencia de anticuerpos anti-toxoplasma revela alto riesgo de infección congénita. No obstante, se observó que el prenatal fue ineficaz para prevenir la toxoplasmosis. Se considera que las orientaciones higiénico-dietéticas asociadas a proyección serológica maternal/neonatal representan una herramienta importante para diagnosticar y prevenir la toxoplasmosis congénita. ***Descriptores***: toxoplasmosis; mujeres embarazadas; prevalencia; factores de riesgo; toxoplasmosis congénita.

[1]Nurse. Graduated from the Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: maritavaris@hotmail.com; [2]Nurse. Graduated from the Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: quel_maraujo@hotmail.com; [3]Nurse. Doctoral Program in Nursing Doctorate Inter-School of Nursing, University of São Paulo / USP. Master Professor of the Nursing Department at the Universidade Federal de Sergipe/UFS. Aracaju (SE), Brazil. E-mail: acfabud@uol.com.br; [4]Nurse. PhD student in Health Sciences at the Federal University of Sergipe/UFS. Master Professor at the Department of Nursing, Federal University of Sergipe Campus Professor Antonio Garcia Filho/UFS. Lagarto (SE), Brazil. E-mail: antoniobalves@gmail.com; [5]Nurse. PhD student in Health Sciences at the Federal University of Sergipe/UFS. Master Professor at the Department of Nursing, Federal University of Sergipe Campus Professor Antônio Garcia Filho/UFS. Lagarto (SE), Brazil. E-mail: mariangela.tao@gmail.com; [6]Nurse. Ph.D. in Child and Adolescent Health at the School of Medicine in Ribeirão Preto / USP. Ph.D Professor in the Department of Nursing at the Federal University of Sergipe/UFS. Aracaju (SE), Brazil. E-mail: ana-dorcas@hotmail.com

INTRODUCTION

Toxoplasmosis is a parasitic disease caused by the *Toxoplasma-gondii,* a protozoan parasite of universal distribution. It attacks man and other homoeothermic animals, assuming generally benign course. It assumes great importance during gestation on account of the risk of transmission from mother to fetus, that takes place when the tachyzoites, present in the mother's circulation, reach the placenta and are transmitted to the fetus hematogenously.[1] It is believed that congenital transmission takes place with greater frequency during the acute infection of the mother, reports existing that it could happen also during the chronic phase of the infection, especially in imnunocompromised pregnant women. [2-3]

It is probable that fetal mortality takes place in 40% to 50% of the infected fetuses and, in the acute phase of the disease, that fetal abortion, births premature or to term can result, giving rise to children who are healthy or with sequelae.[4] Consequently, the sequelae most frequently found in the fetuses that survive are: convulsions, spasticity, microcephaly, hidrocephaly, meningoencephalomyelitis, mental retardation, jaundice, deafness, cutaneous eruptions, in special, the Chorioretinitis, cerebral calcification and the hepatoesplenomegalia.[1] The best form of prevention of toxoplasmosis is the application of dietetic-hygienic measures, thought of as primary prevention.[5] Additionally, serological evaluations to determine the moment in which the infection by the toxoplasma was acquired during the gestation is of basic importance, since the toxoplasmatic infection, during pregnancy, requires intervention and treatment with the objective of reducing the risk of fetal infection, in the incident of this, reducing the risk of sequelae in the child.[6]

In this context, the motivation exists to learn the risk factors associated with the prevalence of toxoplasmosis in our local authority and to evaluate the prenatal care as to preventive measures, having in view that the prenatal is the favorable moment for health education.

The subject is of great relevance for nursing, considering that the nurse carries out prenatal care, is an agent of health promotion and must know the risk factors associated with the acquisition of the *T. gondii* infection, as well as the prevention measures, so that appropriate information can be offered to the pregnant women. Additionally, it is a subject little treated in nursing training, since the study shows that students of the health area demonstrated a deficit in knowledge about prevention of toxoplasmosis.[7]

The predominance of the infection caused by *T. gondii* in pregnant women is more frequent in hot and wet regions, with greater risk of acquisition of the infection in adolescent pregnant women. Increasing with age, reaching all social levels, being commoner it is thought in populations of low socioeconomic and education level, in almost all countries, with positivity varying between 20% and 91.6% of the population.[8-9] Populations with prevalence of anti-toxoplasma IgG antibodies between 25% and 80% have greater risk of congenital infection due to high circulation of the parasite and great proportion of sensitive pregnant women.[10]

In Sergipe, in a study carried out with 9,550 pregnant women, originating from 75 local authorities from Sergipe, the predominance of anti-toxoplasma antibodies found was 69% [IC 95% 68.3% - 70.2%], revealing a great proportion of sensitive pregnant women (31 %).[11]

Data indicate that in Brazil the prevalence of antibodies against *T.gondii* has been declining, as observed in the last decades in Ribeirão Preto (SP), meantime it still continues above 40%, representing a high risk for congenital infection.[12-4]

As regards the congenital infection, one study identified an estimate of prevalence for all the Brazilian states, varying between zero and 20 children congenitally infected to each 10,000 born.[15]

In view of what has been presented, the present study aimed to characterize the profile of the pregnant Aracaju women attended by the Unified Health System (Sistema Único de Saúde - SUS); to verify the frequency of the realization of the examination for detection of anti-toxoplasma antibodies; to determine the prevalence of anti-toxoplasma antibodies in pregnant women; to verify the exposure of these pregnant women to the risk factors related to toxoplasmosis and to identify the association between risk factors of and the presence of specific antibodies for toxoplasmose.

Considering the educative role of the nurse, with the duty of providing primary prevention of toxoplasmosis, knowing that the fetus is at risk principally during primary infection and before the high prevalence of toxoplasmosis in gestating mothers[16], this

research is justified, since it allowed knowing the risk factors of associated with the toxoplasmosis in the population studied, as well as identified the fragilities of the care, which favors the projection of preventive actions.

METHOD

It is a epidemiological study, transverse, descriptive, with a quantitative approach, carried out in the city of Aracaju. The collection of data took place in the period of March to July of 2011 and the sampling was intentionally not probabilistic.

Due to the difficulty of collecting data in 43 basic health units that give prenatal care, in such a way that the sample was representative of all the regions of the local authority of Aracaju, the collection of data was carried out on the opportunity of the admission of the pregnant women for childbirth in the maternity hospitals Nossa Senhora de Lourdes and João Firpo, which attend all the pregnant women assisted by the Unified Health System.

For determination of the sample size, data from the DATASUS[17] was used, in which it identified that in the local authority of Aracaju in 2009, the number of live births was 9,625 children, so, a sample was obtained of 395 pregnant women who met the inclusion criteria: to be a pregnant woman, to reside in Aracaju, to have had prenatal exams, to have the card identifying the woman as pregnant, to accept participating in the research and to sign the terms of free and informed consent (TCLE) in accordance with Resolution 196/96 of the National Council of Health (CNS)/ministry of Health (MS). [18]

For data collection a structured form was used, subdivided into: identification, obstetric history, habits of life and food connected with toxoplasmosis, associated with the analysis of the card of the pregnant woman. The data were processed in the program Epi info 6.0. To verify the association between the presence of anti-toxoplasma antibodies and the risk factors, the Chi-square Test and Exact Univariable Analysis Test of Fisher were applied, with level of significance of 5%.

The research project was approved by the Committee of Ethics in Research of the Federal University of Sergipe under protocol No. CAAE 1192. 0.000.107-08.

RESULTS

Among the 395 pregnant women evaluated, 207 (52.04%) presented results from sorology for toxoplasmosis registered on their prenatal care cards, the other 188 (47.6 %) had no register.

The prevalence of antibodies of the type IgG for toxoplasmosis was 43.5 % [IC 95% 36.6 – 50.5%]. Of the 117 (56.5 %) pregnant women who revealed IgG not reagent in the first serology carried out upon adhering to prenatal carte, only 12 (10.2 %) repeated the serology in the course of the gestation. One pregnant woman who initially was a not reactive for toxoplasmosis specific IgG, showed a reaction in the second examination, revealing possible seroconversion. Acute infection marker of the type IgM was not identified in any pregnant woman of the sample.

The average age was 25.6 years (variation from 14 to 42 years) and there was no statistically significant association of the prevalence of anti-toxoplasma antibodies with the age group (p=0.2 X2=3.19). As for the socioeconomic characteristics, 177 (44.8 %) had not reached secondary school (secondary education), 211 (53.4 %) were not practicing any paid activity and 319 (80.7 %) were living with family income less than three times the minimum wage.

As for the obstetric characteristics, 263 (66.5%) began the prenatal care up to the 12th week of gestation, however 36 (9.1%) began from the 20th. As for the number of consultations, 150 (37.9 %) carried out less than six consultations. As regards the number of gestations, 150 (37.9 %) were primigravida and 149 (37.7 %) multigravida.

Table 1 demonstrates the incident of risk factors for toxoplasmosis among the pregnant women evaluated, a statistically significant relationship having been found between the presence of anti-toxoplasma IgG antibodies and the handling of soil and contact with a cat. Other risk factors evaluated did not present association with the incidence of toxoplasmosis in the studied group.

Table 1. Risk factors for toxoplasmosis and sociodemographic characteristics of pregnant women. Aracaju, 2011.

Variables	IgG+	IgG-	Total	X^2	p-value
Consumption of raw or undercooked meat					
Yes	33	39	72	0.12	0.72
No	57	78	135		
Consumption of raw or undercooked eggs					
Yes	21	34	55	0.59	0,44
No	69	83	152		
Consumption of raw vegetables without washing					
Yes	70	90	160	0,00	0.98
No	20	27	47		
Consumption of unpasteurized raw milk					
Yes	46	56	102	0.10	0.74
No	44	61	105		
Consumption of homemade cheese					
Yes	48	75	123	2.02	0.15
No	42	42	84		
Consumption of smoked foods					
Yes	86	112	198		0.60**
No	04	05	09		
Consumption of untreated water					
Yes	32	42	74	0,01	0.92
No	58	75	133		
Contact with sand or soil handling					
Yes	33	25	58	5.17	0.02*
No	57	92	149		
Contact with cats					
Yes	42	27	69	11.7	<0.001*
No	48	90	138		
Previous pregnancy					
Yes	54	63	117	0.55	0.45
No	36	54	90		
Maternal Age					
Up to 34 years	75	107	182	2.44	0.11
35 years or more	15	10	25		
Trash collection					
Does not have	09	06	15	1.14	0.28
Has	81	111	192		
Sewage					
Does not have	17	21	38	0.00	0.99
Has	73	96	169		
Has resided in rural areas					
Yes	23	35	58	0.29	0.59
No	67	82	149		

*Chi-square test, **Fisher exact test

DISCUSSION

The data revealed prevalence of anti-toxoplasma antibodies of 43.5% [IC 36.6 – 50.5%], which agrees with Brazilian studies.[8,14] However, they were inferior to those found in Aracaju in research done previously, the first one in 2007, whose prevalence was a 77.8% [IC 75.9-79.5%][11] and the second one in 2008 whose prevalence was 61.3% [IC 52.0 – 70.0%][18]. The prevalence of anti-toxoplasma IgG antibodies found in these studies suggests that a reduction has been taking place, observed also in Ribeirão Preto.[12-14] Studies need to be carried out for identification of the causes of this possible reduction.

Meantime, a great proportion of sensitive women is still observed acquiring toxoplasmosis during gestation, demonstrating the necessity of appropriate prenatal care as primary prevention of toxoplasmosis, since her concepts are exposed to this risk.

The data reveal statistically significant association between the prevalence of toxoplasmosis and the handling of soil, as well as contact with a cat, corroborating other studies that also found this association.[19-22]

In the studied sample statistically significant association was not found between the consumption of meat raw or badly cooked, milk not pasteurized, domestic cheese, raw egg, smoked foods, fruits, greens or raw vegetables, contradicting studies that demonstrated association between predominance of anti-toxoplasma antibodies and the incidence of these risk factors.[20-22] Meantime, since it is known that they constitute sources of infection for *T.gondii,* all the pregnant women, especially those known to be sensitive, must receive dietetic-hygienic directions to avoid exposure to these factors of risk.

The studied population presents high risk for the incidence of congenital infection, having seen that this risk during gestation depends on prevalence in a determined region and of the number of sensitive pregnant women.[10] Additionally, the low schooling associated with low socioeconomic level can

increase the risk for infection as shown up in a study carried out with 1261 pregnant women.[9]As for the prenatal care in Aracaju, more than 90% are observed to be covered by the Family Health Strategy (ESF), meantime, the number of consultations was revealed to be below that alleged by the Ministry of Health (MS)[23], not reaching the minimum number of six prenatal consultations.

In spite of the prenatal care protocol of the local authority of Aracaju foreseeing the offer of the serology for identification of toxoplasmosis at the opportunity of the adhesion to prenatal care, it does not promote its repetition in the course of gestation. This demonstrates the fragility of the prenatal triage for the prevention of congenital toxoplasmosis, it has been seen that serology is not done for all pregnant women and not repeated in those sensitive to acquire the infection during pregnancy.

In this study, the one user initially not reagent for IgG specific for toxoplasmosis showed reaction in the second examination. Complementary investigation would need to be carried out to determine if there really was seroconversion during the gestation, with risk of vertical transmission, however, there was no type of continuation or investigation.

The repetition of the examinations in the pregnant woman allows detecting possible seroconversion to prevent the transmission of the infection to the fetus through the treatment of the mother. Not realizing new examinations, increases the risk of the birth of infected children because the opportunity for identifying the acute infection in the pregnant woman is lost (seroconversion).[1,5]

These data demonstrate that prenatal care has presented weaknesses as regards prevention of toxoplasmosis, among them: the late beginning of prenatal care and not realizing the number of consultations recommended by the MS, not realizing the serology in all pregnant women and not repeating in those sensitive to the infection. No serological continuation of the pregnant women sensitive to acquiring toxoplasmosis during gestation makes early diagnosis through the identification of those that seroconverted and the prevention of congenital toxoplasmosis unviable, it having been seen that the treatment must be begun inside the first three weeks after seroconversion.[24]

From what has been stated, the necessity of professionals to carry out prenatal care is emphasized, they catch the pregnant women early on, stimulate the frequency and permanence in prenatal care and intensify the dietetic-hygienic directions, such as: not to eat raw or badly cooked meat, to wear gloves in the contact with soil, to wash raw foods, to wash the hands before meals, to wash the kitchen utensils used in the preparation of food, to avoid contact of meat with foods that will be consumed raw and to filter or to boil the water that will be consumed.

This study demonstrates elevated prevalence of antibodies for toxoplasmosis and worrying coefficients of pregnant women sensitive to acquiring the infection during gestation. It brings support to the discussion of planning for preventive measures appropriate to the reality of the local authority of Aracaju. It was a limitation to have evaluated the pregnant woman at the moment of admission for childbirth; however, it does not invalidate the results, as it managed to respond to the proposed objectives.

CONCLUSION

This study revealed an average age of the 25.6 for pregnant women, of whom 44.8 % had no secondary education, and 53.4% were not practicing paid activity. The beginning of prenatal care took place up to the 12th week of gestation in 66.5%. As for the number of consultations, 37.9% (37.9 %) carried out less than six consultations. Regarding the number of gestations 37.7 % were multigravida.

The prevalence of anti-toxoplasma antibodies was 43.5%, revealing high risk of congenital infection due to the proportion of sensitive pregnant women, on account of the risk factors, especially contact with sand or handling of soil and contact with cats.

It is to be considered that the directions of primary prevention associated with maternal and/or neonatal serological triage, represent important tools in the diagnosis and prevention of congenital toxoplasmosis. So, attendance to the pregnant woman is basic for public health in this investigated population and there is need of improvement of the covering of prenatal care, early reception of the pregnant women and realization of serology for toxoplasmosis, with continuation for those susceptible.

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Corresponding Address

Ana Dorcas de Melo Inagaki
Rua Duque de Caxias, 167, Ap. 1202
Bairro São José
CEP: 49015-320 – Aracaju (SE), Brazil